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Market Orientation and Organizational Performance: Is Innovation a Missing Link?

In recent years, a market-oriented corporate culture increasingly has been considered a key element of superior corporate performance. Although organizational innovativeness is believed to be a potential mediator of this market orientation–corporate performance relationship, much of the evidence to date remains anecdotal or speculative. In this context, the authors present a systematic framework to test the postulated “market orientation–innovation–performance” chain. To this end, the direct causality assumption of market orientation on organizational performance is examined with Narver and Slater’s (1990) market orientation framework. Moreover, the authors take a componentwise approach and examine how the three core components of market orientation (customer orientation, competitor orientation, and interfunctional coordination) affect the two core components of organizational innovativeness (technical versus administrative) en route to affecting corporate performance. Using banking industry data, the authors empirically test and substantiate innovation’s mediating role in the market orientation–corporate performance relationship.

There is only one valid definition of business purpose: to create a customer.... It is the customer who determines what the business is.... Because it is its purpose to create a customer, any business enterprise has two—and only these two—basic functions: marketing and innovation

—Peter F. Drucker, *The Practice of Management*

In recent years, an increasing number of studies have focused on the concept of “market orientation” with the aim of understanding the effect of corporate culture on organizational performance (e.g., Greenley 1995; Kohli and Jaworski 1990; Narver and Slater 1990; Slater and Narver 1994a). Market orientation fundamentally establishes tenets of organizational behavior with respect to a firm’s business constituents (customers, competitors, internal functions), which unequivocally make an impact on organizational performance. In line with this reasoning, researchers have pursued extensively an understanding of the link between market orientation and performance, investigating a direct causal link (Narver and Slater 1990; Ruekert 1992), a moderated relationship (Day and Wensley 1988; Diamantopoulos and Hart 1993; Greenley 1995; Jaworski and Kohli 1993; Slater and Narver 1994a), and even the roles of market orientation’s antecedents (Jaworski and Kohli 1993).

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The interest in the assumed relationship between market orientation and performance ostensibly has remained steadfast for its apparent strategic importance.

Innovation also is an important function of management because it is linked to business performance, as has been demonstrated in many studies (e.g., Damanpour and Evan 1984; Damanpour, Szabat, and Evan 1989; Khan and Manopichetwattana 1989; Zahra, de Belardino, and Boxx 1988). The findings uniformly indicate that a robust relationship, that is, a positive and direct relationship, exists between innovation and performance. As is evidenced by reports of returns on innovation accounting for 50% or more of corporate revenue (Kotler 1991), innovation is becoming increasingly important as a means of survival, not just growth, in the face of intensifying competition and environmental uncertainty (Grønhaug and Kaufmann 1988).

The extant literature, however, has yet to address how market orientation and innovation together influence organizational performance. The significance of focusing on a key function of management in the context of an organizational culture to obtain a better understanding of organizational performance is meaningful on both conceptual and strategic grounds.

First, despite the soundness of its theoretical construct, the role of market orientation on firm performance, whether facilitative or causative, warrants further investigation (Deshpandé, Farley, and Webster 1993). The popular notion has been that a proper execution of market orientation brings about superior performance; however, this assumption increasingly is met with skepticism. For example, Deshpandé, Farley, and Webster (1993) suggest that, conceivably, the most important manifestation of market orientation may be the success of innovations en route to the

success of an organization. The issue of whether market orientation facilitates an organization's innovativeness, however, has yet to be addressed explicitly in the literature.

Second, though the importance of market orientation is acknowledged for its assumed association with organizational performance, the discordant findings on the nature of the market orientation–performance relationship¹ have somewhat limited its strategic value for managers. Although Narver and Slater (1990), Ruekert (1992), and Slater and Narver (1994a) find a positive relationship, Hart and Diamantopoulos (1993) report no significant relationship, and Greenley (1995) and Jaworski and Kohli (1993) encounter mixed results. Accordingly, if the inclusion of the innovation construct can contribute to identifying empirical regularities or reconciling irregularities in the supposed market orientation–performance relationship, the level of confidence in market orientation would be advanced from a strategic standpoint.

The purpose of this article, therefore, is to investigate how market orientation and innovation engage, if at all, in affecting organizational performance. To this end, we explore whether market orientation enhances an organization's innovativeness and, if so, the extent of the consequences on the level of organizational performance. In exploring this relationship, we take a componentwise approach: We examine each of market orientation's three core components for its impact on a dichotomy of innovations (technical versus administrative). We then assess the impact of each innovation component on performance. Also, we take environmental turbulence into account to identify the contingencies for the framework. In summary, we present a framework that synthesizes the knowledge in market orientation and organizational literature to understand the path to organizational performance.

Background

Market Orientation

A market orientation, as a corporate culture, characterizes an organization's disposition to deliver superior value to its customers continuously (Slater and Narver 1994a). The creation of superior customer value entails an organizationwide commitment to continuous information gathering and coordination of customers' needs, competitors' capabilities, and the provisions of other significant market agents and authorities (Slater and Narver 1994b, 1995). The result is an integrated effort on the part of the employees and across departments in an organization, which, in turn, gives rise to superior performance (Kohli and Jaworski 1990).

A closer look at the market orientation construct reveals two prevalent blueprints for delivering superior customer value. First, Kohli and Jaworski (1990) outline a framework that deals with information management protocol and in-

cludes generation and dissemination of and responsiveness to market intelligence, so that the benefits derived from the information can be enhanced when shared among the functions in an organization. In support of this framework, the definition set forth by Narver and Slater (1990) consists of three behavioral components—customer orientation, competitor orientation, and interfunctional coordination—each of which is engaged in intelligence generation, dissemination, and responsiveness to the collected information. Furthermore, they posit that the three core behavioral components are equally important in their informational value. In summary, market orientation scholars designate a market-oriented corporate culture as a significant factor in achieving superior corporate performance. We depict these relationships in Figure 1.

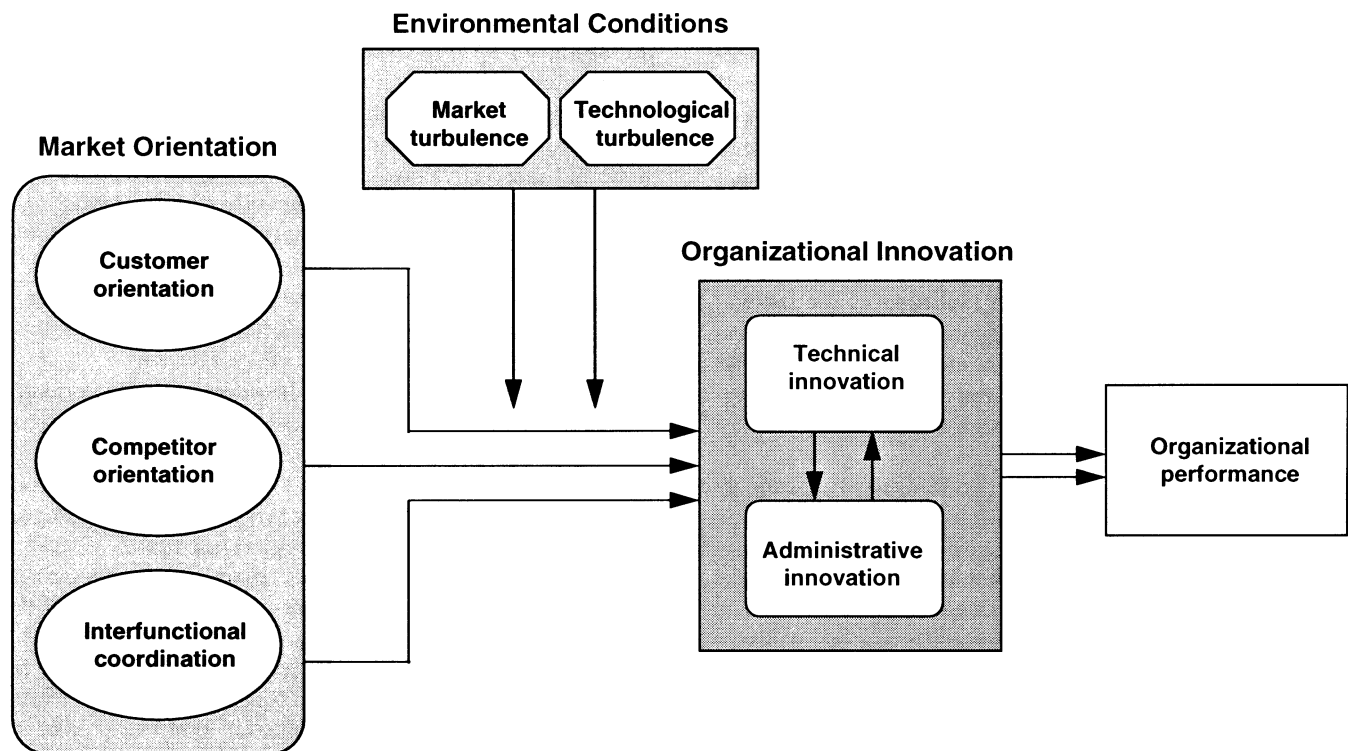
From a strategic standpoint, however, a market orientation remains incomplete if practitioners do not understand the *modus operandi* that gives rise to superior customer value and corporate performance. With discordant findings emerging with respect to market orientation's direct impact on corporate performance, a closer reinspection of market orientation dynamics becomes even more imperative (Greenley 1995). In the effort to uncover the nature of the dynamics, the underlying process has been probed primarily for the strength of the market orientation–performance relationship (for an exception, see Slater and Narver 1994b). For example, potential environmental moderators such as competitive intensity, market turbulence, and technological turbulence have received much attention (Greenley 1995; Jaworski and Kohli 1993; Slater and Narver 1994a), whereas the actual mechanism responsible for transforming market-oriented behavior into superior corporate performance has received scant consideration.

A departure from this practice is Slater and Narver's (1994b) conceptual work, in which they propose innovation as one of the "core value-creating capabilities" that drives the market orientation–performance relationship. This proposition, innovation assuming the mediator role, is consistent with Zaltman, Duncan, and Holbek's (1973) "paradigm of organizational change and innovation." In their seminal work, Zaltman, Duncan, and Holbek (1973) propose the protocol of implementing innovations, after appropriate intelligence gathering and decision making have taken place, as the medium of choice for achieving the business performance target. The notion of the "market orientation–innovation–performance" chain, though seemingly a novel concept in marketing, therefore has its original conceptual grounding in organization literature.

Presently, however, the empirical support for the market orientation–innovation–performance chain is only piecemeal. There are two streams of previous research: One addresses the market orientation–innovation link, the other the innovation–performance link. As was aforementioned, because market orientation literature has just begun to acknowledge the role of innovation in the context of market orientation, the support for the former link is rather sparse. For example, citing Quinn (1986), who observed a strong market orientation in innovative businesses as an example, Slater and Narver (1994b, p. 25) reason that "innovation and

¹Deshpandé and Farley (1996) examine three different market orientation scales developed by Narver and Slater (1990), Kohli, Jaworski, and Kumar (1993), and Deshpandé, Farley, and Webster (1993) on the same data set and find that all three scales correlated with performance measures.

FIGURE 1
Hypothesized Mediator Role of Innovation on the Market Orientation–Performance Relationship



new product success are more likely to result from being market-driven.” Similarly, Deshpandé, Farley, and Webster (1993), after finding performance linked to both market orientation and innovation, speculate on a causal relationship of market orientation, innovation, and performance. Although not a market orientation study, additional support comes from Kitchell’s (1995) work, in which she reports a positive association between “proactive information search” and an organization’s innovativeness. On the whole, the first link in the conjectured market orientation–innovation–performance chain remains relatively weak empirically.

In contrast, the latter link in the chain (that is, the innovation–performance connection) has been examined in many studies in the field of organizational innovation, and much accumulated evidence of robustly positive findings has been found. For example, the robustness of the innovation–performance link has been shown to extend across diverse contexts, including industrial and consumer manufacturing firms (Zahra, de Belardino, and Boxx 1988), service organizations (Subramanian and Nilakanta 1996), and even public institutions (Damanpour and Evan 1984).

Therefore, following the cliché that “a chain is as strong as its weakest link,” empirical inquiry into the market orientation–innovation relationship remains imperative for a better understanding of the process underlying the assumed market orientation–corporate performance connection. If organizational innovation is to be tested as a mediator in the supposed market orientation–performance link, a precise definition of the innovation construct is required. Organiza-

tional innovation literature provides such a conceptual foundation, as is discussed in the following section.

Innovation Construct: Technical Versus Administrative

In marketing, the conventional meaning of the term *innovation* largely refers to new product-related breakthroughs. As a result, the innovation focus in marketing literature has been relatively product intensive. Market orientation, however, involves not only improvements in product-related aspects, but also facilitation of the administrative facets in an organization. This requires studying innovation with a broader scope and making the distinction between technology- and administration-related innovations. In organizational innovation literature, this distinction prevails as one of the most meaningful innovation dichotomies (Daft 1978; Dalton 1968; Damanpour 1991). In Damanpour’s (1991, p. 560) conceptualization, “technical innovations pertain to products, services, and production process technology; they are related to basic work activities and can concern either product or process,” whereas “administrative innovations involve organizational structure and administrative process; they are indirectly related to the basic work activities of an organization.” In the banking industry, for example, the adoption of a point-of-sale versus a computerized book-keeping system would illustrate technical and administrative innovations, respectively (Noe 1996).

Because it is based on technology- versus administration-related criteria, the technical versus administrative dis-

inction seemingly captures the foremost, fundamental dichotomy in the innovation construct (Evan 1966). This innovation dichotomy has been shown to relate differentially to the same predictor variables (Aiken, Bacharach, and French 1980; Daft 1978; Damanpour 1987), as well as in its impact on organizational performance (Damanpour and Evan 1984; Damanpour, Szabat, and Evan 1989). Although other typologies have been advanced to identify the antecedents and consequences of innovations, including continuous versus discontinuous (Robertson 1967), incremental versus radical (Dewar and Dutton 1986), technological versus symbolic (Hirschman 1981), competence enhancing versus destroying (Tushman and Anderson 1986), and architectural versus product (Henderson and Clark 1990),² these distinctions typically regard one type versus the other as substitutes within the dichotomy. According to Damanpour (1991, p. 582), however, “organizational performance may depend more on the congruency between innovations of different types than on each type alone.” To this end, the technical-administrative dichotomy uniquely assumes a complementary view of innovations, which also may be more consistent with a market orientation philosophy. Therefore, investigating how market orientation affects this innovation dichotomy is of particular pertinence to our framework.

Hypotheses on Market Orientation, Innovation, and Performance

Although the market orientation construct has been conceptualized into three distinctive behavioral components in the literature (Narver and Slater 1990; Slater and Narver 1994a, b), the primary emphasis has been on the combined (versus individual) effects of the components in actual practice. The underlying rationale can be ascribed to the supposition that all three components contribute equally in constituting the construct. Nevertheless, Narver and Slater (1990, p. 33–34) admit this contention’s restrictiveness; they note that “future studies should examine the effect of the proportions of the components within a given magnitude of market orientation.”³ Also, by citing literature that promotes customer orientation as a number-one priority, they further note the possibility of the customer orientation component playing a relatively larger role in market orientation dynamics. Day and Nedungadi (1994) find that only 15.5% of firms take a balanced stance on being “market driven,” which makes the soundness of the uniform role of the components somewhat dubious. We therefore propose to examine the market orientation dynamics, following the conventional combined ap-

proach as well as the component-level approach, for a more detailed inspection.

Market Orientation: The Combined Approach

We first examine the market orientation-innovation-performance chain using the combined approach, because the findings at this level can serve to benchmark the componentwise analyses in terms of insightfulness, with respect to the proposed sequence of effects. To this end, H_1 addresses the structure of the market orientation-performance relationship. Aggregating circumstantial and piecemeal support for innovation serving a mediational role, we posit that

H_1 : Innovativeness mediates the relationship between market orientation and performance.

Using the single market orientation construct as a baseline, we address the need to inspect the relationship in more detail (at the behavioral component level) in the hypotheses that follow.

Customer Orientation

Although some researchers consider customer orientation as important as competitor focus and interfunctional coordination (e.g., Narver and Slater 1990), others consider it the most fundamental aspect of a corporate culture (e.g., Deshpandé, Farley, and Webster 1993; Lawton and Parasuraman 1980). The rationale behind the high profiling of customer focus is the marketing concept, which promotes putting the interests of customers first. Accordingly, because customer orientation places the highest priority on continuously finding ways to provide superior customer value, an increased commitment to customer orientation should result in “increased boundary-spanning activity,” beyond the status quo (Pierce and Delbecq 1977). In other words, customer orientation advocates a continuous, proactive disposition toward meeting customers’ exigencies. A focus on total customer satisfaction thereby fosters continuous innovation (Peters 1984).

In line with this reasoning, Deshpandé, Farley, and Webster (1993) demonstrate a positive correlation between customer orientation and innovative firms, but they do not make the distinction of whether the firms are innovative in technical or administrative aspects. Organizations committed to superior customer value, however, have been shown to innovate throughout their entire business system, as opposed to solely in products or services (Parsons 1991). Although business system reengineering, which is a form of administrative innovation, occurs less frequently than its product and/or service counterparts, which are forms of technical innovation, Parsons posits the former to be equally significant (and perhaps even more so for an enterprise in a service industry) in delivering superior value to customers.

This notion of a customer-focused culture facilitating organizational innovativeness in both technical and administrative areas is consistent with the position of long-term orientation forwarded by the marketing concept. Because the marketing concept pushes a business enterprise to be forward-looking, a customer-oriented business is likely to be more interested in the long-term business outlook than in

²For more in-depth discussions on innovation typologies, refer to Damanpour (1991) and Zaltman, Duncan, and Holbek (1973).

³Slater and Narver (1994a) develop, though not an entirely separate assessment of the three behavioral components, a relative measure of competitor to customer orientation. After accounting for the effect of the market orientation at the combined level, they report that the relative emphasis (of competitor and customer orientation) has no significant impact on performance, irrespective of the environmental context.

short-term profits (Felton 1959). In other words, both types of innovations (technical and administrative) represent a long-term investment to an organization; thus, a firm is likely to encounter more innovativeness in a customer-oriented culture compared with a less customer-focused one (e.g., a firm with a myopic, profit-seeking goal). For example, Kitchell (1995) finds that future-oriented firms are, in general, more innovative. Thus, we expect customer-oriented business culture to influence an organization's innovativeness positively:

H_{2a}: Customer orientation has a positive impact on innovativeness in technical areas.

H_{2b}: Customer orientation has a positive impact on innovativeness in administrative areas.

Competitor Orientation

Customer focus might play a key part in the strategy to create superior customer value, but an effective strategy requires more than simply customer-centered methods. A complete reliance on customer orientation often can lead to incompleteness in business strategy, which leaves an organization prone to a reactive posture, as opposed to a proactive disposition, in coping with competitors' strategies (Day and Wensley 1988). However, an unbalanced focus on competitors also is not desirable because exclusive attention on the competition can lead to the neglect of the exigencies of customers (Deshpandé, Farley, and Webster 1993). Therefore, Day and Wensley (1988) propose that a balanced mix of customer and competitor orientation is a requisite for maintaining a competitive advantage in the marketplace, which is consistent with Narver and Slater's (1990) equal weighting of market orientation's core components.

Competitor orientation essentially centers on the following questions: (1) Who are the competitors? (2) What technologies do they offer? and (3) Do they represent an attractive alternative from the perspective of the target customers (Slater and Narver 1994b)? On the whole, competitor orientation entails gathering intelligence on these three questions. The core methodology typically consists of measuring a company directly against its target competitors (Day and Wensley 1988).

Using the target rivals as a frame of reference, competitor-oriented firms seek to identify their own strengths and weaknesses. Although such an approach often yields helpful insights into their relative standing in the marketplace, judgments rendered by managers typically exhibit a bias toward placing disproportionate weight on hard evidence (i.e., tangible and visible factors) (Barnes 1984). Such a bias emphasizes the role of technical innovations rather than administrative ones, because the former, which relate to technology, offer both tangibility and visibility, whereas the latter, which relate to administration, offer neither. Moreover, Stevenson (1976) finds that managers base their judgments of strengths/weaknesses primarily on the technical and marketing attributes of the product and/or service offerings. Marketing attributes, not to mention technical ones, are apparent in technical innovations, but such is generally not the case for administrative ones.

The implication is that, because the objective of competitor-centered methods is to keep pace with or stay ahead of the rest of the field, a competitor-oriented culture should facilitate innovations. However, because the competitor assessments generally yield partiality toward the consideration of hard evidence (i.e., technical and marketing attributes), we expect competitor orientation to facilitate innovations of the technical type, with less impact on the administrative.

H_{3a}: Competitor orientation has a positive impact on innovativeness in technical areas.

H_{3b}: Competitor orientation has no direct impact on innovativeness in administrative areas.

Interfunctional Coordination

Interfunctional coordination represents the third in the series of core market orientation components identified by Narver and Slater (1990). For the marketing concept to be implemented properly, Felton (1959) insists on integrating all other functions of business with those of marketing. Several decades after the advent of the marketing concept, there are indications that practitioners are acknowledging the responsibility of a market orientation as reaching beyond the scope of the marketing department alone. In field interviews with several enterprises, senior management often has noted that various departments being cognizant of the market intelligence was not sufficient and that coordinated effort among various functions was instrumental in the firm's responsiveness to customer needs (Kohli and Jaworski 1990).

Zaltman, Duncan, and Holbek (1973) offer an explanation of how openness in communication across functions facilitates responsiveness to customers. As functions are integrated across departments in an organization, the problem-solving capabilities potentially are enhanced by employees working toward the common goal; however, if personnel in different departments do not open up to one another, they are more likely to conform to their routine mode of problem solving and less likely to be creative and take risks. Zaltman, Duncan, and Holbek further relate openness in communication to organizational innovativeness.

Evidence supporting how interfunctional integration and openness in communication relate to organizational innovativeness is available from many studies that focus on organizational characteristics and their implications. For example, in a meta-analysis with a sample of 782 studies, Damanpour (1991) reports a positive association between internal communication, which reflects the extent of cross-functional communication and coordination, and organizational innovativeness. The correlation between interfunctional coordination and organizational innovativeness occurs as an outcome of an interfunctional relationship that fosters both trust and dependence among the cross-functional personnel (Argyris 1982; Gupta, Raj, and Wilemon 1986; Olson, Walker, and Ruekert 1995; Ruekert and Walker 1987; Zaltman, Duncan, and Holbek 1973). Argyris (1982) argues that organizational participants typically face uncertainty in dealing with innovations, coupled with the absence of preestablished rules or procedures to follow. In such situations, interfunctional integration and openness in communications provide the bridgework in mitigating distrust and

conflicts among the separate functional units. This, in turn, provides an environment that is more receptive to innovations.

The manner in which the extent of interfunctional coordination is made pervasive in a business culture can be managed through various integration mechanisms, including the frequency of committee meetings (Aiken and Hage 1971; Kim 1980), the number of face-to-face contacts in horizontal and vertical relationships (Aiken, Bacharach, and French 1980), and the degree to which units share decisions (Hull and Hage 1982). Furthermore, even in mechanistic organizations, Zmud (1982, p. 1422) illustrates that those with organic overlay, whose "resultant organizational climate ... provides more opportunities for innovations to arise and is more supportive of efforts toward innovation," become more conducive to innovations in technical and administrative areas. In summary, we expect interfunctional coordination to support innovativeness in technical and administrative areas by allaying mistrust while building confidence among the disparate functions.

H_{4a}: Interfunctional coordination has a positive impact on innovativeness in technical areas.

H_{4b}: Interfunctional coordination has a positive impact on innovativeness in administrative areas.

Innovation and Performance

The link between organizational innovativeness and performance stands as the most concordantly documented part of the postulated market orientation–innovation–performance chain. The rationale behind organizational innovativeness showing a strong, positive influence on performance is ascribed to innovations that serve to accommodate the uncertainties (i.e., market and technological turbulence) a firm faces in its entrepreneurial environment (Ettlie and Bridges 1982). Damanpour and Evan (1984, p. 393) posit that "organizations can cope with environmental changes and uncertainties ... by successfully integrating technical or administrative changes into their organizational structure that improve the level of achievement of their goals." Accordingly,

H_{5a}: Technical innovations have a positive, direct impact on performance.

H_{5b}: Administrative innovations have a positive, direct impact on performance.

Although most studies investigating innovation's influence on performance assume either a technical or administrative innovation focus, the ones that study the effects of both concurrently advocate the adoption of both for an optimal organizational performance (Damanpour and Evan 1984; Damanpour, Szabat, and Evan 1989; Kimberly and Evanisko 1981). For example, Damanpour, Szabat, and Evan illustrate this point with a bank that offers a new service requiring a new set of administrative mechanisms to evaluate and control its performance. Moreover, they emphasize that technical innovations do not always prompt administrative innovations. The reverse might be the case, because an organizational administrative component, which is more open to new ideas, may be a prerequisite to

the adoption of technical innovations. A one-to-one correspondence in the adoption of technical versus administrative innovations, however, is not advised; rather, a balanced adoption, which will ensure the equilibrium between the technical system and the social structure, is advocated (Trist 1981). Damanpour and Evan (1984) posit that, though administrative innovations do not occur as frequently or visibly as their technical counterparts, their impact on corporate performance may be as important, both directly and indirectly. Taking the synergistic relationship between the two innovation types into account, we propose the following hypothesis:

H₆: The two innovation types (technical and administrative) interact positively with each other and therefore have a synergistic impact on performance.

Environmental Moderators

Prior research has acknowledged that potentially external environmental factors can moderate the extent of a market orientation's effects on business performance (Greenley 1995; Jaworski and Kohli 1993; Slater and Narver 1994a). In particular, turbulences in the market and technology have been cited as such factors. The turbulences in the market and technology typically are generated by heterogeneity in consumer preferences or irresolution of industry technological standards, respectively. We examine whether the same environmental factors also moderate the market orientation–innovation portion of the postulated market orientation–innovation–performance chain. For insight into the market orientation–innovation link in the context of environmental uncertainties, we briefly review the roles of both market orientation and innovation.

For organizations, innovations often represent a means to deal with the turbulence of the external environment (Ettlie and Bridges 1982; Gupta, Raj, and Wilemon 1986; Weiss and Heide 1993). Because we forward the premise that a market-oriented business culture facilitates organizational innovativeness, we expect the relationship to appear even stronger in turbulent environmental settings. The rationale is as follows: At the core of market orientation is market intelligence, which entails generation and dissemination of and responsiveness to market information (Kohli and Jaworski 1990). In turbulent environmental settings, firms with superior market information (which parallels a market-oriented corporate culture) exhibit superior responsiveness, typically through organizational innovativeness, in dealing with the turbulences in the environment. Therefore,

H₇: Environmental uncertainty strengthens the market orientation–innovativeness relationship.

Research Design

Sample

The sample consists of 134 banks from a midwestern state. The banking industry was selected because the recent deregulation in this industry has given banks autonomy with respect to the types of services offered to customers and the environment in which to provide such services (Combs and Bourne 1995). Thus, banks can manage various aspects of

their operations as technical innovations (i.e., in the form of technology acquisitions) and administrative innovations (i.e., in the form of business systems redesign) with substantially fewer governmental restrictions, according to the terms of deregulation. Moreover, the industry fits the criterion of having multiple markets with varying levels of environmental dynamism—a condition required to observe firms making strategic decisions about innovative activities (Miller and Friesen 1986).

Data Collection

A random sample of 225 banks was drawn from the banking association list of a midwestern state. We identified the person in charge of the marketing function at the senior management level of each bank and followed Huber and Power's (1985) guideline for single informant data collection. Two weeks before the questionnaires were mailed, the state banking association announced the upcoming mailing in its newsletter. The questionnaires were sent out, accompanied by (1) a cover letter from the president of the banking association soliciting cooperation and (2) a letter from the researchers plus general instructions for the survey. Responses were obtained from 134 of 225 banks contacted (59.5% response rate).

Instrument

Questionnaire protocol served as the primary means for data collection. The questionnaire was developed and refined to assess the organization's technical versus administrative innovativeness on the basis of (1) the original instruments used in other studies and (2) field interviews with managers in ten banking institutions.

Measures

Market orientation. The extent of an organization's market orientation was assessed by employing Narver and Slater's (1990) procedures (see Appendix A). For each market orientation component, the measure was derived by taking the mean value of all the items listed under the component. As we show in Table 1, the Cronbach's alpha coefficients of the three core components—customer orientation (.83), competitor orientation (.79), and interfunctional coordination (.79)—surpass the .70 threshold recommended by Nunnally (1978) for the test of scale reliability.

Innovation. Measures of technical and administrative innovations were operationalized on the basis of the absolute number of innovations implemented in the respective categories for each bank (Damanpour and Evan 1984; Damanpour, Szabat, and Evan 1989).⁴ In developing the instrument to assess the extent of innovativeness, we first conducted field interviews in ten different banks (four small-, three medium-, and three large-sized) to compile a list of technical and administrative innovations. Specifically, we gath-

TABLE 1
Market Orientation Component Reliability Analysis

Market Orientation Component	Item-to-Total Correlation	Cronbach's Alpha
Customer Orientation		.83
Customer commitment	.56	
Create customer value	.58	
Understand customer needs	.56	
Customer satisfaction objectives	.66	
Measure customer satisfaction*	.54	
After-sales service	.64	
Competitor Orientation		.79
Salespeople share competitor information	.66	
Respond rapidly to competitors' actions	.78	
Top managers discuss competitors' strategies	.85	
Target opportunities for competitive advantage	.82	
Interfunctional Coordination		.79
Interfunctional customer calls	.66	
Information shared among functions	.42	
Functional integration in strategy	.58	
All functions contribute to customer value	.59	
Share resources with other business units	.55	

*Dropped from the scale because of low loading in factor analysis.

ered information on technical and administrative innovations that (1) had been implemented by the banks within the past five years, (2) had been implemented by competitors but were not available in their own banks, and (3) had the potential to be implemented within the next several years. From these sublists, a final list of technical and administrative innovations was compiled by a team of three managers who represented a small, a medium, and a large bank to ensure representativeness of responses from banks of varying sizes and minimize the possibility of floor and ceiling effects for small or large banks, respectively.

In the questionnaire, the respondents were asked to indicate, from the compiled list, which of the technical and administrative innovations presently were in use at his or her bank and the year of implementation (see Appendix B). In determining the absolute number of innovations, we only included those innovations that had been implemented within five years of the base year used to assess organizational performance. This protocol therefore ensured that both parties (researchers and respondents) were referring to the same technical and administrative innovations.

Performance. Business performance measures were assessed on growth and profitability (McKee, Varadarajan, and Pride 1989). For objective measures, financial reports

⁴The relative measure of innovation (Damanpour and Evan 1984), using the percentage of total innovation, also was assessed, but the results of the study did not change with this measure.

on net income growth and return on asset were obtained. Also, as a face validity check on respondent reliability, self-reported measures on relative growth and profitability of the banks were assessed.⁵

Environmental turbulence. The respondents indicated the extent of environmental turbulences, pertaining to the market and technology, they encounter in their business environment. Following Greenley (1995), Jaworski and Kohli (1993), and Slater and Narver's (1994a) lead, we have adapted Miller's (1987) environmental dynamism scale to assess the environmental turbulences (market and technological) in the banking industry. Although our study is based on single-industry data, we expect to find variations in the environment because literature on strategic groups have shown that firms in the same industry, but belonging to different strategic groups, encounter dissimilar business environments and competitive conditions (e.g., Aldrich and Auster 1986; Boeker 1988; Burgelman 1983; Porter 1979). Firms of small, versus large, size typically have been shown to belong to different strategic groups, in which each group faces varying competitive and environmental conditions; often their strategies reflect their external conditions (Kanter 1983; Pinchot 1985; Sebor, Hartman, and Tower 1994). Such strategic group alignment has been shown to exist in the banking industry as well (Mahmood and Moon 1984). In this respect, despite the single-industry data, we expect environmental turbulence to be a significant factor in our study. Accordingly, we assessed a set of four questions, each covering market and technological turbulences, and the reliability of the market turbulence (.79) and technological (.70) scales follows the recommended criteria (Nunnally 1978) (see Table 2).

Construct Validity for the Three Behavioral Components

The key premises of our hypotheses rest on the validity of the three behavioral constructs. We performed a factor analysis with varimax rotation (see Table 3). For the customer orientation factor, five of the six original variables are loaded reasonably highly (.73, .55, .65, .52, .68). The exception was "measure customer satisfaction," which we dropped from the measurement instrument list in subsequent analyses.⁶ For the competitor orientation factor, all four original variables have high loadings (.71, .65, .79, .78). Also, for the interfunctional coordination factor, all five original variables have reasonably high loadings (.57, .43, .52, .59, .60). These results confirm the unidimensionality of the

TABLE 2
Environmental Turbulence Reliability Analysis

Environmental Turbulence	Item-to-Total Correlation	Cronbach's Alpha
Market Turbulence		.79
Extent of market turbulence in the environment	.62	
Frequent changes in customer preferences	.67	
Ability to reduce market uncertainty	.50	
Ability to respond to market opportunities	.59	
Technological Turbulence		.70
Extent of technological turbulence in the environment	.72	
Leadership in product/process innovation	.85	
Impact of new technology on operations	.68	
Allocating resources to research and planning	.66	

three behavioral components and further add credence to the justification for a componentwise approach.⁷

Model Specification

- (1)
$$\begin{aligned} \text{TECH} = & \beta_{i0} + \beta_{i1} (\text{MKOR}_i) + \beta_{i2} (\text{MKTB}) \\ & + \beta_{i3} (\text{MKOR}_i \times \text{MKTB}) + \beta_{i4} (\text{TCTB}) \\ & + \beta_{i5} (\text{MKOR}_i \times \text{TCTB}) + \beta_{i6} (\text{ADMN}) \\ & + \epsilon_{i1}, \text{ for } i = 1 \text{ to } 4; \end{aligned}$$
- (2)
$$\begin{aligned} \text{ADMN} = & \beta_{i7} + \beta_{i8} (\text{MKOR}_i) + \beta_{i9} (\text{MKTB}) \\ & + \beta_{i10} (\text{MKOR}_i \times \text{MKTB}) + \beta_{i11} (\text{TCTB}) \\ & + \beta_{i12} (\text{MKOR}_i \times \text{TCTB}) + \beta_{i13} (\text{TECH}) \\ & + \epsilon_{i2}, \text{ for } i = 1 \text{ to } 4; \text{ and} \end{aligned}$$
- (3)
$$\begin{aligned} \text{PERF} = & \beta_{i14} + \beta_{i15} (\text{TECH}) + \beta_{i16} (\text{ADMN}) \\ & + \beta_{i17} (\text{MKOR}_i) + \epsilon_{i3}, \text{ for } i = 1 \text{ to } 4; \end{aligned}$$

where

TECH = technical innovation,
ADMN = administrative innovation,
MKOR₁ = market orientation's combined construct,
MKOR₂ = customer orientation,
MKOR₃ = competitor orientation,

⁷Confirmatory factor analysis for a one-factor structure (the combined market orientation measure) versus a three-factor structure was carried out as well. For the one-factor structure, the goodness-of-fit index (GFI) and adjusted goodness-of-fit index (AGFI) were .850 and .796, respectively, which showed an acceptable range of model fit. The χ^2 was 125.662 ($p < .05$), which provided a marginal fit, and χ^2/df was 1.632, which was acceptable. The root mean square residual (RMSR) was as low as .076. For the three-factor structure, GFI = .893, AGFI = .848, $\chi^2 = 94.067$ ($p > .05$), $\chi^2/\text{df} = 1.271$, and RMSR = .069. From these results, we find that the three-factor measure provides a better fit to the data than the one-factor measure, even though both offer reasonable fit indices.

⁵The four performance measures (objective and self-reported measures of growth and return on assets) produced similar results with respect to the hypotheses. Therefore, we report only the objective measure of growth in this study.

⁶Because most of the banks indicated that they implemented "formalized system for customer feedback" in the administrative innovation measure, the lack of variability on this facet among the banks surveyed may explain the nonsignificance of Narver and Slater's (1990) element of "measure customer satisfaction" in the customer orientation component.

TABLE 3
Factor Analysis with Varimax Rotation

Items Under Market Orientation Components	Factor*		
	F1	F2	F3
Customer commitment	.02	.73	.10
Create customer value	.15	.55	.08
Understand customer needs	.14	.65	.04
Customer satisfaction objectives	.41	.52	.27
Measure customer satisfaction**	.56	-.01	-.26
After-sales service	.07	.68	-.22
Salespeople share competitor information	.71	.16	-.10
Respond rapidly to competitors' action	.65	.15	.23
Top managers discuss competitors' strategies	.79	-.10	.16
Target opportunities for competitive advantage	.78	.18	.08
Interfunctional customer calls	-.10	-.16	.57
Information shared among functions	.11	.22	.43
Functional integration in strategy	.00	.04	.52
All functions contribute to customer value	.05	.09	.59
Share resources with other business units	.10	-.08	.60
Percentage variance explained	23.76	11.88	10.31

*Underlying dimensions identified as three factors by scree test: F1 = competitor orientation, F2 = customer orientation, and F3 = interfunctional coordination.

**Deleted from customer orientation scale in the model-estimation stage.

Note: numbers in boxes indicate items that load highly for each of the three factors.

MKOR₄ = interfunctional coordination,
MKTB = market turbulence,
TCTB = technological turbulence,
PERF = performance, and
all ϵ s = disturbance terms for the respective equations.

Model Estimation

The system of equations illustrated in Figure 1 was estimated using a three-stage least squares (3SLS) analysis (Judge et al. 1985). We use each of the three market orientation components and their interactions with the two environmental turbulences as instrumental variables. For the moderator test of the two environmental turbulences, we include the main effects of the corresponding variables, in addition to the interactions (Baron and Kenny 1986). To incorporate the Chow test for these interaction effects (that is, between market orientation components and environmental turbulences), we use dummy variable analyses (Kennedy 1989) by classifying each environmental turbulence (market and technological) into high versus low levels, using the average values of the turbulence variable (Slater and Narver 1994a).

Results

Mediational Role of Innovation: The Combined Approach

To investigate the mediational role of innovation between market orientation and performance, we first assess a set of simple regressions: (1) market orientation on performance and (2) technical and administrative innovation, each sepa-

ately, on performance. Although the parameter estimates for both types of innovations are positive and significant on performance, as was expected, that of market orientation on performance is positive but nonsignificant (see Table 4, Part A). This nonrobust relationship between market orientation and performance, however, is not entirely unexpected, in light of the nonsignificant and mixed findings in prior research (Greenley 1995; Hart and Diamantopoulos 1993; Jaworski and Kohli 1993).

We proceed with the mediational testing by subjecting the market orientation–innovation–performance chain to 3SLS procedures (see Table 4, Part B). The results show that market orientation makes a significant contribution toward superior performance when innovations are accounted for: Market orientation facilitates both technical ($\beta^1_1 = .21$; $p < .10$) and administrative ($\beta^1_8 = .56$; $p < .05$) innovations, which, in turn, abet corporate performance ($\beta^1_{15} = 235.20$; $p < .05$ and $\beta^1_{16} = 77.05$; $p < .05$, respectively). Therefore, the mediational hypothesis is supported at the supracomponent level of market orientation.

Customer Orientation and Organizational Innovation

H_{2a} and H_{2b} suggest that there is a positive relationship between customer orientation and organizational innovativeness. Such relationships are supported, because the customer orientation parameters, β^2_1 in the case of technical innovation (H_{2a}) and β^2_8 for administrative (H_{2b}), are both positive and significant ($\beta^2_1 = .47$; $p < .05$ and $\beta^2_8 = 1.08$; $p < .05$) (see Table 5, Part A). Therefore, H_{2a} and H_{2b} are supported fully. We also postulate that the strength of this rela-

tionship is moderated by environmental uncertainties (H_7). For customer orientation, H_7 is supported for technical turbulence but not for market turbulence. The interaction be-

tween customer orientation and technological turbulence is evident in the context of both technical ($\beta^2_5 = .09$; $p < .05$) and administrative ($\beta^2_{12} = .24$; $p < .05$) innovations; howev-

TABLE 4
Mediator Test for Innovation Between Market Orientation and Performance:
A Single Market Orientation Construct Level Analysis

A. Separate Simple Regressions			
Dependent Variable	Market Orientation	Technical Innovation	Administrative Innovation
Performance	n.s.		
Performance		55.19**	
Performance			47.34**

B. 3SLS Model Estimation Results of Market Orientation–Innovation–Performance Chain

Dependent Variable	Market Orientation	Market Turbulence	Market Turbulence Interaction	Technical Turbulence	Technical Turbulence Interaction	Technical Innovation	Administrative Innovation
Technical innovation	.21*	n.s.	n.s.	n.s.	.03*		.37**
Administrative innovation	.56**	n.s.	.03*	n.s.	.09*	1.33**	
Performance	n.s.					235.20**	77.05**

* $p < .10$.

** $p < .05$.

n.s. = $p > .10$.

TABLE 5
3SLS Model Estimation Results of Componentwise Approach to Market Orientation–Innovation–Performance Chain

A. Customer Orientation							
Dependent Variable	Customer Orientation	Market Turbulence	Market Turbulence Interaction	Technical Turbulence	Technical Turbulence Interaction	Technical Innovation	Administrative Innovation
Technical innovation	.47**	.27*	n.s.	n.s.	.09**		.43**
Administrative innovation	1.08**	n.s.	n.s.	.21*	.24**	2.36**	
Performance	n.s.					105.39**	29.04**

B. Competitor Orientation

Dependent Variable	Customer Orientation	Market Turbulence	Market Turbulence Interaction	Technical Turbulence	Technical Turbulence Interaction	Technical Innovation	Administrative Innovation
Technical innovation	n.s.	.15**	n.s.	.18**	.21**		.28**
Administrative innovation	n.s.	.66**	.31**	.44*	.43**	1.23**	
Performance	n.s.					95.18**	41.26**

C. Interfunctional Coordination

Dependent Variable	Customer Orientation	Market Turbulence	Market Turbulence Interaction	Technical Turbulence	Technical Turbulence Interaction	Technical Innovation	Administrative Innovation
Technical innovation	n.s.	n.s.	.06**	n.s.	.15**		.20**
Administrative innovation	n.s.	.69*	.26**	.60**	.36**	1.27**	
Performance	n.s.					141.01**	30.74**

* $p < .10$.

** $p < .05$.

n.s. = $p > .10$.

er, the interaction between customer orientation and market turbulence is not significant for either technical ($\beta^2_3 = \text{n.s.}$) or administrative ($\beta^2_{10} = \text{n.s.}$) innovation.

Competitor Orientation and Organizational Innovation

Competitor orientation is posited to facilitate technical innovations (H_{3a}) but to have no measurable direct impact on administrative innovations (H_{3b}). Contrary to the prediction, the parameter estimate for competitor orientation is not statistically significant for technical innovations ($\beta^3_1 = \text{n.s.}$). However, H_{3b} is supported because the parameter estimate for competitor orientation also is not statistically significant for administrative innovations ($\beta^3_8 = \text{n.s.}$).

An examination of the interaction effect between competitor orientation and environmental uncertainties on organizational innovativeness reveals a slightly different pattern than the customer orientation context. That is, the interaction between competitor orientation and technological turbulence is robust in the context of both technical ($\beta^3_5 = .21$; $p < .05$) and administrative ($\beta^3_{12} = .43$; $p < .05$) innovations, but the interaction between competitor orientation and market turbulence, though not significant for technical ($\beta^3_3 = \text{n.s.}$) innovations, is significant for administrative ($\beta^3_{10} = .31$; $p < .05$) innovations. Therefore, H_7 , the turbulence hypothesis for competitor orientation, is supported in all but the market turbulence–technical innovation interaction case.

Interfunctional Coordination and Organizational Innovation

H_{4a} and H_{4b} predict a positive relationship between interfunctional coordination and organizational innovativeness in the technical and administrative areas, respectively. Such relationships are supported if the interfunctional coordination parameters (β^4_1 for technical and β^4_8 for administrative) are both significant and positive. However, H_{4a} and H_{4b} are not supported, because neither of the parameters approaches a level of statistical significance.

Both types of environmental uncertainties appear to moderate the impact of interfunctional coordination on organizational innovativeness in general. The interaction between the interfunctional coordination component and the market turbulence term is significant for both technical ($\beta^4_3 = .06$; $p < .05$) and administrative ($\beta^4_{10} = .26$; $p < .05$) innovations. Moreover, the interaction between the interfunctional coordination component and the technological turbulence term is significant for both technical ($\beta^4_5 = .15$; $p < .05$) and administrative ($\beta^4_{12} = .36$; $p < .05$) innovations. Therefore, H_7 , in the context of interfunctional coordination, is supported fully for both types of environmental uncertainties.

Organizational Innovation and Performance

H_{5a} and H_{5b} posit technical and administrative innovations, respectively, to have positive, direct impacts on performance. Both are confirmed, because the parameter estimates for technical and administrative innovations are positive and significant across all component-level estimation results. Moreover, H_6 postulates that one type of organizational innovation interacts positively with the other, and vice versa,

thereby making an indirect impact on organizational performance through the other type of innovation. H_6 is confirmed, because the parameter estimates reveal a synergistic relationship between technical and administrative innovations across all component-level analyses.

Discussion

The key objective of this study is to examine the role that organizational innovations play in the context of the relationship between market orientation and business performance. In general, we empirically provide some evidence that market orientation facilitates an organization's innovativeness, which, in turn, positively influences its business performance. This mediational evidence has been found at both the supracomponent and each-component level and, thus, provides a more complete understanding of how market orientation might be related to performance.

At the component level of analysis, we find the customer orientation component the dominant factor responsible for this mediational phenomenon; the main effect of customer orientation is highly significant for organizational innovativeness, but those of competitor orientation and interfunctional coordination do not approach a level of significance. This finding is in line with the interpretation of the marketing concept forwarded by Lawton and Parasuraman (1980), who place the highest priority on customer orientation but assign adequate considerations to competitor-related and intraorganizational aspects, and with Peters's (1984) claim that superior corporate performance is derived from a commitment to total customer satisfaction, which can be brought about by continuous innovation.

The results of the main effect, however, do not signify that the other two components of market orientation are unimportant. On the contrary, competitor orientation and interfunctional coordination may be just as important, or even more so, in conditions of relatively high environmental uncertainty. Our results indicate that all three components of market orientation are conducive to facilitating both technical and administrative innovations when the level of technological turbulence in the business environment is relatively high. Our results, however, run counter to the findings from previous research; Jaworski and Kohli (1993) do not report any significant effects of technological turbulence, whereas Slater and Narver (1994a) find technological turbulence to moderate negatively the strength of the market orientation–performance relationship.

The conflicting findings might be explained by industry differences in the amount of time required before innovation starts contributing to performance (Greenley 1995). For banking, because it is a service industry and, in particular, because its nature entails dealing directly with money, the period between the implementation of innovations and their impact on performance is typically shorter than that of the manufacturing sector. Therefore, depending on the phase of the implementation stage, innovations, in an accounting sense, can have a positive or negative impact on performance (Capon et al. 1992). Nonetheless, in the long run, our results are consistent with the notion that innovations represent the most effective means to deal with the turbulence in

external environments (Gupta, Raj, and Wilemon 1986; Weiss and Heide 1993).

In conditions of high market turbulence, interfunctional coordination is the only market orientation component that exhibits a significant facilitating effect on both types of innovation. Because market turbulence pertains to the heterogeneity of customer preferences and the rate of preference change, it is especially surprising that the customer orientation component was not significant for either type of innovation. One explanation for such findings is that our data on innovations captured an implementation stage of the innovations. Customer orientation is more likely to assume a larger role in the adoption stage, whereas in the implementation stage, cooperation across functions may be more instrumental in the success of adopted innovations.

The results for the innovation–performance link not only underscore the separate contributions of technical and administrative innovations to corporate performance but also lend support to synergies between the two types of innovations enhancing overall corporate performance. Our findings reinforce Trist's (1981) recommendation that an organization take a balanced approach to innovations for optimal results.

To summarize, we explored the role of organizational innovations in the assumed market orientation–performance relationship. In the process, we reaffirmed that innovations, as vital components of business performance, warrant organizationwide attention for successful implementation of both technical and administrative kinds. This requires a committed, market-oriented corporate culture that will facilitate organizational innovativeness, which increasingly is becoming a key factor in delivering superior corporate performance. Also, it may be useful to take a componentwise approach to the market orientation construct, because the roles of different market orientation components might vary, contingent on the types of innovation strategies and turbulences present in the environment.

Managerial Implications

The precept that market orientation facilitates the furtherance of corporate performance already has gained wide recognition among practitioners. However, the manner in which to go about implementing this process remains somewhat unclear. Our study provides some support that innovations facilitate the conversion of market-oriented business philosophy into superior corporate performance. For many years, firms have been taking such a lead by focusing on organizational innovations, primarily technical. Moreover, in recent years, there has been a growing trend toward focusing attention on administrative innovations, such as business systems redesign. The independent potentials of the two innovation types are becoming evident to managers, but an emphasis on the balanced adoption and implementation of the two types does not appear to be prevalent. The results of our study reinforce the notion of “balance” between technical and administrative innovations: The synergistic process between the two types of innovation yields added benefits compared with the independent effects of each type of innovation. Therefore, firms can coordinate future innovation plans by considering the two types of innovations in tandem

to arrive at a combination that will yield optimal levels of performance.

Furthermore, a market orientation culture should be designed with the innovation strategy in mind, and vice versa. Being market oriented or market driven alone increasingly does not appear to be comprehensive enough to be used as a strategic beacon in achieving competitive advantage. Accordingly, Slater and Narver (1995) advocate “organizational learning,” and Day (1994) suggests “anticipating future needs for capabilities” to supplement market-oriented or market-driven planning. In a similar spirit, formulating an innovation strategy to complement the firm's market orientation strategy should provide a more coherent and comprehensive road map for organizations to follow.

In prior research, market orientation has been found to be more effective in affecting performance, contingent on the business environmental conditions the firm faces (Slater and Narver 1994a). Likewise, the results of our study suggest that market orientation is conducive to providing an innovation-friendly environment, which also is contingent on factors in the business environment. As Jaworski and Kohli (1993) and Slater and Narver (1994a) concur, market orientation, as a complex process, entails substantial financial and resource commitment by the organization. This study indicates that different market orientation components differentially interact with various environmental variables in facilitating innovations. Therefore, an organization hoping to enhance corporate performance through innovation should consider the following steps for an efficient allocation of its resources: (1) determine the current business environmental conditions the firm faces and (2) allocate resources disproportionately to the market orientation component that is most effective in the identified condition.

Limitations and Directions for Further Research

There are several key factors beyond the scope of this study that we leave for future investigation. First, our study emphasizes the importance of administrative innovations at parity with technical ones. Our findings should be considered in light of a single-industry case sample (the banking sector). In the banking industry, a service sector, administrative innovation might assume relatively equal importance to its technical counterpart in influencing performance, as compared with its role in manufacturing sector data. Prior studies (Damanpour and Evan 1984; Damanpour, Szabat, and Evan 1989), which also advocate the equal importance of the dichotomous innovative impact on performance, use data from a service sector as well (the public library system). However, studies that use a sample from the manufacturing sector typically assume a technical innovation focus (Kimberly and Evanisko 1981). Whether this technical disposition is due to higher visibility or is the result of actual, greater importance in the manufacturing sector has yet to be clarified. Hence, future studies should examine the relative importance of the technical–administrative innovation dichotomy in other industries, the manufacturing sector in particular.

Second, we use innovation data from the implementation stage (as opposed to the adoption phase) of innovation. Zaltman, Duncan, and Holbek (1973) posit that the organi-

zational dimensions (formalization, centralization, and departmentalization) may relate unevenly to the different stages of innovation (adoption and implementation). Moreover, these organizational dimensions have been identified

as potential antecedents of market orientation (Kohli and Jaworski 1990). Additional research should involve investigating the contingent effects of the market orientation components at different stages of innovation.

APPENDIX A Market Orientation Scale

For each of the following questions, please indicate the response that most closely describes your organization.

Strongly Disagree 1	Moderately Disagree 2	Neither Agree Nor Disagree 3	Moderately Agree 4	Strongly Agree 5

APPENDIX B Technical and Administrative Innovations

Please indicate if your bank offers or uses the following services. If YES, please provide the year they were implemented in your bank.

	Implemented		If "YES," When
High-function Automatic Teller Machine (ATM)*	Yes	No	Year 19 _____
Debit card*	Yes	No	Year 19 _____
Electronic Funds Transfer at Point of Sale (EFTPOS) system*	Yes	No	Year 19 _____
Telephone/home banking	Yes	No	Year 19 _____
Computerized telephone exchange with voice response	Yes	No	Year 19 _____
24-hour customer service hotline	Yes	No	Year 19 _____
Electronic communication to corporate client*	Yes	No	Year 19 _____
Remote international transaction	Yes	No	Year 19 _____
Envelope settlement service	Yes	No	Year 19 _____
Cash management accounts*	Yes	No	Year 19 _____
Electronic data interchange (EDI)	Yes	No	Year 19 _____
International wire transfer	Yes	No	Year 19 _____
Account reconciliation (partial/full)	Yes	No	Year 19 _____
Authentication key	Yes	No	Year 19 _____
Payroll preparation	Yes	No	Year 19 _____
Autopay service	Yes	No	Year 19 _____
Alternative mortgage loan (AML)	Yes	No	Year 19 _____
Remote lease financing*	Yes	No	Year 19 _____
Shared appreciation mortgage (SAM)	Yes	No	Year 19 _____
Brokerage service (discount/full)*	Yes	No	Year 19 _____

Please indicate if your bank has implemented the following administrative mechanisms. If YES, please provide the year they were implemented in your bank.

	Implemented		If "YES," When
Electronic mail	Yes	No	Year 19 _____
Tele-/Videoconferencing	Yes	No	Year 19 _____
Local Area Network support (LAN)	Yes	No	Year 19 _____
Wide Area Network support (WAN)	Yes	No	Year 19 _____
Customer information database*	Yes	No	Year 19 _____
Formalized system for customer feedback*	Yes	No	Year 19 _____
Automated bookkeeping system	Yes	No	Year 19 _____
Automated credit scoring	Yes	No	Year 19 _____
Automated loan tracking	Yes	No	Year 19 _____
Integrated pricing software linked to credit scoring	Yes	No	Year 19 _____
Laptop loan origination capabilities	Yes	No	Year 19 _____
Telephony/Remote job entry*	Yes	No	Year 19 _____
Expenditure-control budgeting (ECB)	Yes	No	Year 19 _____
Zero-based budgeting*	Yes	No	Year 19 _____
Data center audit	Yes	No	Year 19 _____
Computerized personnel records*	Yes	No	Year 19 _____
Employee continuing-education program*	Yes	No	Year 19 _____
Flextime*	Yes	No	Year 19 _____
Formalized management by objectives *	Yes	No	Year 19 _____
Specialized personnel for ad hoc problems*	Yes	No	Year 19 _____
Job rotation*	Yes	No	Year 19 _____
Quality value engineering	Yes	No	Year 19 _____
Human resource accounting	Yes	No	Year 19 _____
Incentive systems for officers*	Yes	No	Year 19 _____
Incentive systems for nonofficers*	Yes	No	Year 19 _____

*Indicates items that also appear in Subramanian and Nilakanta's (1996) list for technical and administrative innovations in the banking industry.

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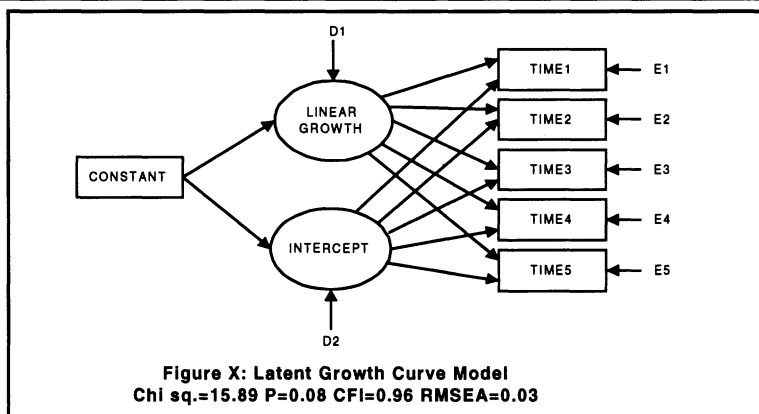
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